favourable season, *i. e.* the time *before the formation of new ice*, no vessel had as yet made such an attempt. This was the aim of the Swedish Expedition, and it found—

(1) That the polar sea is far more open in the autumn than at any other season of the year, but that even then the passage is soon stopped by dense and impenetrable masses of broken ice.

(2) That during the winter the polar basin is covered by an unbroken ice, and that the freezing of the surface begins as early as the end of September. From September 23 to October 12 we had almost every day, either with the steamer or with boats, to cross new-formed ice.

(3) That an autumn cruise north of 80½° lat. is attended with unusual dangers, owing to the darkness and storms then prevailing, no ships being able a long time to sustain a night storm among large rolling pieces of ice and a cold of —15° Cent. If the ship has the good luck not to be more or less damaged by the constant unavoidable encounters with the ice mounts, it will soon by the immediate freezing of the washing waves be itself quite covered and pressed down by ice.

(4) The idea of an open and comparatively milder polar basin is quite chimerical; on the contrary, 20′–30′ north of Spitzbergen a region of cold seems to begin which no doubt stretches far around the pole.

(5) The only plan to attain the pole, from which success can be expected, is that adopted by most English arctic men, namely of going northward by sledges in the winter either from Smith Sound or Seven Islands.

I remain, Sir,
Your obedient humble Servant,
A. E. NORDENSKIÖLD.

P.S. As soon as the magnetical observations of Dr. Lemström shall be duly worked out I will send you a copy of them.

Should you think it worth communicating this letter to the Royal Geographical Society, I beg you especially to inform its celebrated President, Sir R. Murchison, that besides other specimens interesting in a geological point of view (for instance, a mass of *Miocene* and *coal* plants, bones of *Ichthyosaurus*? &c.), we found a number of large fish fragments, probably belonging to the Devonian age, in the red slate of Liebde Bay, constituting the overmost layer of what I in my 'Geology of Spitzbergen' called Hecla block-formation. Accordingly Sir Roderick probably is right in supposing that the deeper layers of this "formation" belong to the Silurian age. The underlying crystalline plates are evidently Laurentian.

II. The reading of Mr. Lockyer's Paper, "Spectroscopic Observation of the Sun, No. II.," was resumed and concluded.

(Abstract.)

THE author, after referring to his ineffectual attempts since 1866 to observe the spectrum of the prominences with an instrument of small dispersive powers, gave an account of the delays which had impeded the construction of a larger one (the funds for which were supplied by the Government-Grant Committee early in 1867), in order that the coincidence in time between his results and those obtained by the Indian observers might not be misinterpreted.

Details are given of the observations made by the new instrument, which was received incomplete on the 16th of October. These observations include the discovery, and exact determination of the lines, of the prominence-spectrum on the 20th of October, and of the fact that the prominences are merely local aggregations of a gaseous medium which entirely envelopes the sun. The term *Chromosphere* is suggested for this envelope, in order to distinguish it from the cool absorbing atmosphere on the one hand, and from the white light-giving photosphere on the other. The possibility of variations in the thickness of this envelope is suggested, and the phenomena presented by the star in Corona are referred to.

It is stated that, under proper instrumental and atmospheric conditions, the spectrum of the chromosphere is always visible in every part of the sun's periphery ; its height, and the dimensions and shapes of several prominences, observed at different times, are given in the paper. One prominence, 3′ high, was observed on the 20th October.

Two of the lines correspond with Fraunhofer's C and F ; another lies 8° or 9° (of Kirchhoff's scale) from D towards E. There is another bright line, which occasionally makes its appearance near C, but slightly less refrangible than that line. It is remarked that the line near D has no corresponding line ordinarily visible in the solar spectrum. The author has been led by his observations to ascribe great variation of brilliancy to the lines. On the 5th of November a prominence was observed in which the action was evidently very intense ; and on this occasion the light and colour of the line at F were most vivid. This was not observed all along the line visible in the field of view of the instrument, but only at certain parts of the line which appeared to widen out.

The author points out that the line F invariably expands (that the band of light gets wider and wider) as the sun is approached, and that the C line and the D line do not; and he enlarges upon the importance of this fact, taken in connexion with the researches of Plücker, Hittorf, and Frankland on the spectrum of hydrogen—stating at the same time that he is engaged in researches on gaseous spectra which, it is possible, will enable us to determine the temperature and pressure at the surfaces of the chromosphere, and to give a full explanation of the various colours of the prominences which have been observed at different times.

The paper also refers to certain bright regions in the solar spectrum itself.

Evidence is adduced to show that possibly a chromosphere is, under certain conditions, a regular part of star-economy ; and the outburst of the star in Corona is especially dwelt upon.